THURSDAY, JUNE 2, 1904.

SIR WILLIAM FLOWER.

Sir William Henry Flower, K.C.B., &c.; a Personal Memoir. By C. J. Cornish. Pp. xi+274; illustrated. (London: Macmillan and Co., Ltd., 1904.) Price 8*s.* 6*d.* net.

THAT the life of a man of the social and scientific position of the late director of the natural history branch of the British Museum should be written, and written, moreover, by a master of popular literature, will, we think, be admitted on all hands, and in tendering a hearty welcome to this record of a distinguished career and a fine character, we trust we shall be expressing the views of no inconsiderable section of the public, and of all our readers. Mr. Cornish, whose name needs no introduction of ours to the reading public, has been fortunate in securing the cooperation of several members of the late Sir William's family in the compilation of the memoir before us, so that all the details with regard to early life and family history may be accepted as thoroughly authentic. The first two chapters, dealing with the period ending with the return from the Crimea, are, indeed, written by Mr. Victor Flower, Sir William's youngest son, while the final chapter of the biography, describing the closing scenes, is from the pen of his widow, Lady Flower. Nor is this by any means all in the way of contributions by members of the family to the biography, for the eldest daughter of Sir William, Mrs. Shann, takes the public into her confidence with regard to family life in the well known house adjacent to the Museum of the Royal College of Surgeons, while another daughter, Mrs. Biddulph, communicates a note on the summer holidays of the Flower family in early days. No critic can therefore complain of any lack of breadth in the lines upon which the biography has been drawn up; we have, indeed, not only the life-history of the central figure, but a large amount of information with regard to the family generally.

The memoir, as the author says in his preface, is essentially a personal one, and does not in any way claim to give an account of Sir William's scientific work, which must remain for a future biographer.

Although the biography of a scientific man in which there is no detailed reference to, or criticism of, the work from which he gained his reputation reminds us of the well known saying in regard to the play of "Hamlet," yet, if we may judge from what little he has attempted in this line, Mr. Cornish has been decidedly well advised in confining himself in the main to the personal aspect of his subject. When, for instance, he strays even such a short distance away from this track as to compile a list of Sir William's scientific papers, he displays a lamentable carelessness and a lack of knowledge of both the principles of bibliography and of zoological nomenclature. The want of accuracy in matters of this nature is indeed displayed even on the title-page of his memoir, where we find Sir William described as president of the *Royal* Zoological Society.

To justify our assertion as to the want of care displayed in the compilation of the list of scientific papers and books given in one of the appendices,[1] we need only refer, in the first place, to the following "misprints," as we suppose they must be euphemistically termed. On p. 252 we have, for instance, *Hylobatus* for *Hylobates, syndactilis* for *syndactylus,* and *javenicus* for *javanicus.* On the following page, and elsewhere, we find *Physalius* for *Physalus,* on p. 254 *geoffrensis* for *geoffroyensis,* and on p. 256 *Helitherium* for *Halitherium* and *arnuschi* for *arnuxi.* Nor are such errors confined to the appendix, for in the text (which is wholly the author's) we find on p. 121 Étteridge for Etheridge, and on p. 175 *Hyperodon* for *Hyperöodon.* In the case of the bibliography, at any rate, such errors (at which no one would have been more annoyed than Flower, who was the very spirit of accuracy in such matters) might have been easily detected by checking the list with the Royal Society's "Catalogue of Scientific Papers."

Nor is this all, for we find want of uniformity in regard to the references to the serials in which the papers originally appeared. For instance, we have on p. 257 *Journ. Anth. Inst.* and on p. 258 *Anthropol. Inst. Journ.,* while on the latter page we find *Zool. Soc. Proc.* as the equivalent of *Zool. Soc. Proc. London* on p. 260. Again, we should much like to know the meaning, so far as the Roman numerals are concerned, of the following entries on the page last mentioned, viz. "Zool. Soc. Proc. London, 1884, cxi. p. 417," and "Zool. Soc. Proc. London, 1884, xi. p. 206."

Reverting to the book itself, we find the fourth and fifth chapters devoted to the period during which Flower was officially connected with the Museum of the Royal College of Surgeons. Here the author records the energetic manner in which Flower set himself to work to render the museum more useful to students, and the inventions he devised for the better display or more convenient handling of the specimens exhibited. Family life during this period forms the subject of chapter vi., while in the following chapter we are introduced to some of Sir William's personal friends, among whom were Dean Stanley, Prof. Huxley, and the late Duke of Argyll. Chapters ix. to xiii. treat of the second portion of Sir William's official career, during which he was head of the museum in the Cromwell Road. Here, in the main, the author records very fairly the changes and improvements introduced gradually and tactfully during Flower's administration, dwelling especially on the installation of the "index museum" and the other contents of the central hall, and also directing attention to the better manner of displaying specimens introduced under the new *régime.* We fail, however, to understand the meaning of the sentence on p. 149, in which it is recorded that

> "In 1898 the rearrangements of the mammals on Flower's system were nearly completed for the classes Chiroptera (bats), Edentata, and Primates."

As a matter of fact, the provisional arrangement of all the orders (not classes) had been by that time com-

---

[1] The list is stated to have been compiled by Mr. Victor Flower, but the author must be held responsible for its inaccuracies.

© 1904 Nature Publishing Group

pleted (so far as anything in a museum can be said to be complete), while the Edentata, which was one of the first groups taken in hand, had been arranged at least a couple of years previously.

Limitations of space forbid fuller notice, and we may conclude by mentioning that while special chapters are devoted to his favourite subjects, anthropology and cetaceans, the three final chapters deal with the later and closing scenes of Sir William's life. Of four excellent portraits, those taken in his later years serve to remind old friends of Flower's striking personality. Bearing in mind the limitations already mentioned, the author is decidedly to be congratulated on the attractive manner in which he has laid before the public the main features of a very interesting and highly successful scientific career. R. L.

THE IDENTIFICATION OF ORGANIC COMPOUNDS.

A Method for the Identification of Pure Organic Compounds. Vol. i. By S. P. Mulliken, Ph.D. Pp. xii+364. (New York: John Wiley and Sons; London: Chapman and Hall, Ltd., 1904.) Price 21*s*. net.

THIS is the first of a series of volumes which are intended to facilitate the identification of organic substances. The scheme commonly, though not invariably, adopted by organic chemists in this connection is to determine the molecular formula of the compound under investigation, and then to refer to Richter's "Lexicon," in which all known organic compounds are tabulated according to their molecular formulæ. Further agreement is established by a comparison of physical and chemical properties. The author considers that the difficult technique of conducting an ultimate organic analysis, upon which the above system mainly depends, "is fully mastered only by long practice," and that there is a shorter cut to the same result. This short cut consists in finding, in the first instance, to what class of compounds—hydrocarbon, alcohol, aldehyde, acid, &c.—the substance belongs, and, when this has been done, in determining such simple physical characters as melting-point, boiling-point, specific gravity, colour, smell, &c., which will lead to its identification. It is therefore necessary for purposes of reference that all the known organic compounds should be grouped into separate classes. This is what the author has done. In each class the individual members are arranged in the order of increasing boiling-point or melting-point. For example, let us suppose that the substance, the identity of which is required, proves to be an acid. All the known organic acids are divided into tables of liquid and solid acids, and these again into categories, which are either soluble or insoluble in water. Suppose that the acid under investigation is a liquid which is soluble in water. Having turned to the table containing the liquid acids soluble in water, an examination of the first column of boiling points will lead, perhaps, to the discovery of one corresponding to the unknown acid. Under this compound a series of characteristic reactions are described which will enable the investigator to fix the identity of his compound by means of a few simple tests.

There is very little that is new in the above method. It is one which is adopted, consciously or otherwise, by the majority of chemists, whether they possess the skill requisite to conduct an ultimate organic analysis or not. That carefully elaborated methods are at present in use for determining the constitution of a substance by chemical tests is clearly shown by the existence of such a volume as Hans Meyer's, which has been translated into English, and has already reached a second edition.

In point of fact, when a substance has been obtained in a state of purity, its identification is as a rule not a serious undertaking. The character of the substance from which it is derived will usually furnish a clue to its nature, and a few characteristic tests will soon set the matter at rest. If the identification of a compound is a crucial matter, few chemists would rest content with anything less than a direct comparison of the product with the known substance, for melting- and boiling-points are apt to vary a little with the apparatus and form of thermometer employed, and colour reactions do not always produce quite the same tint unless the conditions of the experiment are the same.

It is the separation of a compound from a mixture and its purification which make the greatest demands on the skill and experience of a chemist. Compared with this, an ultimate organic analysis and the characterisation of a compound by chemical tests offer little difficulty.

There is no intention to disparage the labour which has been expended on this work. The careful revision of the reactions of many of the substances found in the tables would entitle the book to grateful recognition, in addition to which there is much useful and practical information on the method of applying the different reactions which every organic chemist will appreciate. It would be incorrect, moreover, to state that the tables will not serve the object for which they have been compiled. The question is only whether the object is worth the labour which it entails, seeing that most of the information may be derived indirectly from other sources.

The biological system of classification of substances into orders, genera and species cannot be commended. It is unnecessary and undesirable. There is no analogy in the application of these terms in the two sciences, and their use may be misleading. Chemical nomenclature still suffers in this country from such a false analogy, when *radicle* was adopted in place of *radical*. J. B. C.

THE MIND OF THE CHILD.

Educational Psychology. By Edward Thorndike, Adjunct Professor of Genetic Psychology in Teachers' College, Columbia University. Pp. vii + 177. (New York: Lemcke and Büchner, 1903.)

THIS volume embodies the results of investigations in which Prof. Thorndike has interested himself and his pupils for some time past, applying the methods

© 1904 Nature Publishing Group